NS Dept. of Natural Resources

Insectary Notes

January/February 2009

From the Editor

Another info-packed issue is here! For an introduction to our newest staff member, check out Gina's Prov. Entomologist's Overview. Chrissy Campbell, the new Science Officer - Pest Management, has written an article on "What to Watch For" in the (hopefully) soon to be arriving spring season.

Keith has been busy collecting the information from the NSDTIR weather stations. Was it as cold as you thought it was? Check out the article on page 6 and find out. Also, I've put together the results from the gypsy moth multipher trap survey on page 7.

'Til next time,

Jacqui

Editing . . . a Rewording Activity

Contents

(click on article title for navigation)

Prov. Entomologist's Overview . . . . . Page 2

Bits and Pieces

Don't Move Firewood . . . . . Page 2

Insect Focus

What to Watch For (Part 1) . . . . . Page 3

Project Updates

And How Cold Was It? . . . . . Page 6

Gypsy Moth Multipher Trap Survey . . . . . Page 7

Say What and Quotes . . .

It was so cold that . . .

- the hands on my wristwatch were begging for mittens.
- *Superman froze his S off.*
- this year, Santa kept the coal.
- *my teeth were chattering, so I went over and took them out of the cup.*
- I saw a teenager wearing a coat and boots.
- my pipes froze. Not just my windpipe, but also my tailpipe.
- Al Gore is now in favor of global warming.
- *we had to chop up the piano for firewood, but we only got 2 chords.*
- my Blackberry turned into a blueberry.

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Provincial Entomologist's Overview . . What's the Buzz?

Back to page 1

It has been said many times, by many people, that life's only constant is change. So you'll be happy to know that Forest Protection is nothing if not consistent. We've undergone several changes over the last few months, one of them being my reassignment to responsibilities within the National Forest Pest Strategy until 31 March 2010. I'll still be based out of the Shubenacadie office, however I find it pretty much impossible to work two jobs at once so I am pleased to announce that Christina (Chrissy) Campbell has joined our team as the new Science Officer - Pest Management. She will be taking over the bulk of my duties as Provincial Forest Entomologist. Chrissy comes to DNR Forest Protection with a wealth of experience. After completing her bachelor of science in biology at the University of New Brunswick, Chrissy headed to the University of Toronto to complete a Masters of Science in Forestry focussing on invertebrate pathology. Please join me in welcoming Chrissy. She can be contacted by phone at 902-758-7238 or by email at campbecs@gov.ns.ca

Until Next Time,

Gina

Provincial Forest Entomologist

Bits and Pieces

Back to page 1

Don't Move Firewood

(Information from the Canadian Food Inspection Agency website)

Throwing a few pieces of firewood into the trunk of the car before a camping trip might seem like a good way to plan ahead, but those innocent looking logs could destroy a forest. Moving firewood, even just a few kilometres away, can spread invasive insects and diseases to our forests.

It might seem difficult to imagine, but something as simple as bringing your own firewood when you travel to or from your favourite campsite could threaten and destroy thousands, even millions, of trees.

Transportation of firewood is a common way for invasive species to spread. Hidden under the bark where you can't see them, these pests are moved across Canada.

Help control the spread of invasive species

- **BUY** and burn local firewood only.
- **LEARN** where your firewood comes from.
- **FIND** out if you are living in or traveling to an area regulated for an invasive species.
- **LEAVE** natural items in their natural habitats.

Invasive species affect us all. They create an imbalance in nature by using up the resources that native species need to survive. Like a ripple in a pond, the impact is far-reaching and can cause widespread damage to Canada's forests. These pests can cause trees to disappear from our forests, cities, streets and parks. This can affect air and water quality. It can deprive citizens of shade and animals of habitat while damaging private property and reducing land value. One of the easiest ways to control the spread of invasive species such as the brown spruce longhorn beetle or the emerald ash borer is to simply not move wood from one area to another, even if it's just a few kilometres. You never know what might be hiding in or under the bark!

For more information on how you can protect our forests from invasive alien species . . .
http://www.inspection.gc.ca/english/plaveg/for/prod/firee.shtml

Insect Focus

Back to page 1

What to Watch For - Part 1

Chrissy Campbell, Science Officer, Pest Management

With the warmer season rapidly approaching, forest pests should once again be brought to the forefront. A common question arises: "What should we be looking for?" In part one of this two-part series, I will focus on the Balsam Woolly Adelgid, Balsam Twig Aphid, Balsam Gall Midge, Balsam Shootboring Sawfly, Gypsy Moth, Yellow Witches Broom, and Sirococcus Shoot Blight.

Balsam Woolly Adelgid (BWA)

The Balsam Woolly Adelgid is a sucking insect of true firs and causes the formation of dense compression wood and top kill. In Christmas trees, it causes tree deformation (gouting) and devaluation. Typically, it has two generations per year. The nymphs will emerge from the overwintering sites in the spring and undergo three successive molts. Egg lay occurs in May followed by nymph emergence. Nymphs will disperse, then settle into a feeding site where they will feed all summer long. Eggs laid in late summer will overwinter as nymphs.

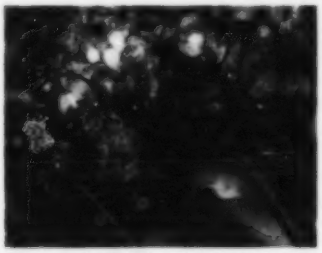


Figure 1. BWA adult covered in waxy, white wool.

Figure 2. Three levels of gouting - light to severe (left to right).

So what can you do for detection? Early detection is essential. The earliest sign is typically white waxy, woolly masses appearing on the lower bole and possibly larger branches. This sign emerges in spring and early summer. Gouting, the swelling of shoots and distorting at the nodes, is commonly observed in the crown. For Christmas trees, you can check for BWA populations by using the procedure developed by Mike LeBlanc and Keith Moore. The complete method is available at:

http://www.gov.ns.ca/natr/forestprotection/foresthealth/Sheets/bwapp.asp

What can you do for management practices? In forest stands, infected tree removal is not always practical or possible. Best to hope for -25°C to - 30°C winter weather. In Christmas tree lots, remove and destroy infested trees (including seed trees), preferably in the winter months. For more information please visit:

http://www.gov.ns.ca/natr/forestprotection/foresthealth/sheets/bwa.asp

Balsam Gall Midge (BGM)

The Balsam Gall Midge is of concern to many Christmas tree growers. The adults, tiny flies, typically emerge early in the spring and lay eggs. The egg hatches and the larva goes into the base of the needle. A gall is formed and the larva feeds within this gall. In the autumn, the larvae will drop from the needles and go into the soil to overwinter.

Figure 3. Adult balsam gall midge [1].

Figure 4. Galled needles on balsam fir [1].

So what can you do for detection and management? Examine your trees for galls. In high infestations, extensive defoliation can occur. This insect rarely causes long term damage and the trees will generally recover in approximately four years. For additional control options and information, please visit:

http://www.gov.ns.ca/natr/forestprotection/foresthealth/sheets/bgm.asp

Balsam Twig Aphid (BTA)

The balsam twig aphid occurs regularly in Nova Scotia. Damage lowers the value of the tree and may even cause mortality. This aphid generally has three to four generations per year. Egg hatch occurs in the spring and the nymphs cause little damage. The adults appear in June followed by offspring production. These nymphs suck the sap of new shoots and cause twisted, short, and deformed needles on the current year's growth. During the height of the infestation in June, the aphid's woolly wax and droplets of sticky honeydew (excrement) are evident. Adults emerge late in June and find a new host tree. Offspring are produced and these nymphs cause little damage. Adults emerge and lay eggs. Overwintering occurs in the egg stage.

Figure 5: BTA adult [2].

So what can you do for detection and management? Examine the branches for shortened and deformed needles on the current year's growth. In June, examine your trees for white woolly wax and honeydew. Additionally, you may see the associated black sooty mould later in the season. Control options are limited since application should occur when the buds are 20% flushed. For additional information and more detailed control options, please visit:
http://www.gov.ns.ca/natr/forestprotection/foresthealth/sheets/Bta.asp

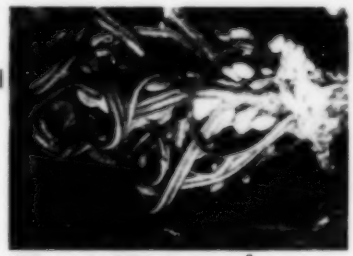


Figure 6: BTA damage [3].

Balsam Shootboring Sawfly (BSbS)

Although the balsam shootboring sawfly generally does not cause tree mortality, it is of concern to Christmas tree growers because of the unsightly damage. Generally, young firs less than two meters in height are the preferred host. Adults emerge in April and May followed by egg lay. Larvae are present from May to July and bore a tunnel in a new shoot to feed. This sawfly overwinters in the pupal stage.

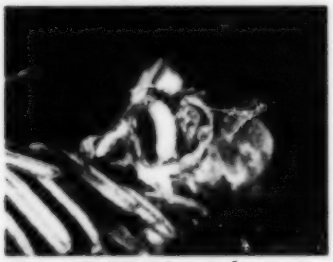


Figure 7. BSbS larvae [1].

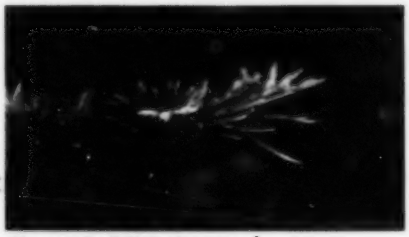


Figure 8: BSbS damage [1].

So what can you do for detection and management? Look for wilting of the current year's growth which may be reddish brown in colour. A word of caution, the observed damage usually evident by June may resemble frost damage. For ornamentals and Christmas trees, annual shoots can be pruned to improve appearance. Currently, there are no control measures used in Canada. For more information, please visit:
http://imfc.cfl.scf.rncan.gc.ca/insecte-insect-eng.asp?geID=8030

Gypsy Moth (GM)

Currently, the gypsy moth is not a major forest defoliator in Nova Scotia, however, it causes damage in urban areas in the western region and is a concern to those exporting products from and through the CFIA regulated zone. It is an aggressive feeder and has many known host trees. Oak, apple, and birch are the preferred hosts but older larvae will feed on softwoods such as hemlock, pine and spruce. Larvae typically appear in May followed by pupation approximately 40 days later. Moths appear in late July and August and the eggs are laid in masses.

Figure 9. Late instar GM larvae.

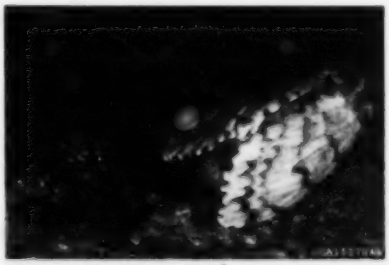


Figure 10: Adult GM [4].

So what can you do for detection and management? Examine your trees early in the season for thin looking crowns. Look for egg masses, larvae, and moths. As a homeowner, scrap off all egg masses and ensure you obtain the entire mass. Immerse the egg mass in vegetable oil ensuring the entire mass is covered and leave it there for a few days. If there is a heavy infestation then other control methods may be considered. For a description of appearance of the life stages and for more control information, please visit:

http://www.gov.ns.ca/natr/forestprotection/foresthealth/sheets/gm.asp

Yellow Witches Broom

What is it? How do you detect it? What are the management options? Yellow Witches Broom, a rust fungus, causes abnormal shoot growth on balsam fir. It can be of concern especially to Christmas tree growers. This fungus is especially problematic if the chickweed population is high, because chickweed is the rust's alternate host. At first, very little effect on the trees is seen. In the second year, the upright shoots become thicker, the needles are stunted becoming pale green in colour and arranged spirally. As the summer progresses, the needles yellow and fall off thus giving rise to the "broom." Branches with brooms typically will have galls and cankers as well. For management, one should remove the brooms when they are small but if the brooms are large then the whole tree should be removed. Additionally, removal of the alternate host, chickweed, is recommended. For more information, please visit:

Figure 11. Broom on Balsam fir [5]

http://www.gov.ns.ca/natr/forestprotection/foresthealth/sheets/yell.asp

Sirococcus Shoot Blight (Red Pine Shoot Blight)

Typically in Nova Scotia, *Sirococcus conigenus*, a fungus, affects red pine and may be of a concern for plantation and nursery owners. Infection is commonly found in the lower branches but can spread rapidly throughout the crown and/or through a plantation. Young understory trees are particularly vulnerable. Generally in the forest, uneven aged stands are at risk.

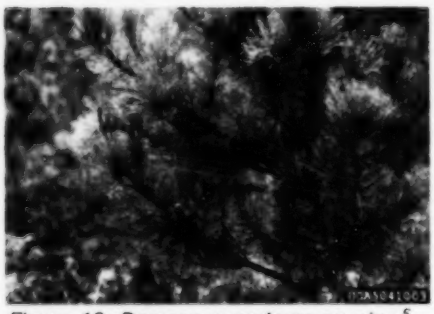


Figure 12: Damage symptoms on pine [5].

So what can you do for detection and management? Watch for needles that have collapsed at the base and appear drooped. Needles will become reddish changing to a bleached, straw-like colour. In the spring, look for black fruiting bodies at the base of the newly deceased needles. Small, purplish cankers that appear elongated and sunken may be present along the twig into the main stem. In nurseries and plantations, infected trees should be removed in the winter. For ornamental growers, infected shoots should be pruned off prior to bud break in the spring. For additional information and more control options, please visit:

Figure 13: Damage symptoms on pine [5]

http://imfc.cfl.scf.rncan.gc.ca/maladie-disease-eng.asp?geID=409

Image Credits

[1] Ronald S. Kelley, Vermont Department of Forests, Parks and Recreation, US, Bugwood.org
[2] Rayanne Lehman, Pennsylvania Department of Agriculture, US, Bugwood.org
[3] E. Bradford Walker, Vermont Department of Forests, Parks and Recreation, US, Bugwood.org
[4] USDA Forest Service - Region 8 Archive, USDA Forest Service, US, Bugwood.org
[5] John O'Brien, USDA Forest Service, US, Bugwood.org

Project Updates

Back to page 1

AND JUST HOW COLD WAS IT?

Keith Moore and Jacqui Gordon

Table 1. NS DEPT. OF TRANSPORTATION AND INFRASTRUCTURE RENEWAL WEATHER STATION DATA. COLDEST RECORDED TEMPERATURES (°C) FOR WINTER* 2004 TO WINTER* 2009***.

Location	Winter* 04	Winter* 05	Winter* 06	Winter* 07	Winter* 08	Winter* 09
North Sydney	-19	-18	-18	-19	-23	-20
Canso	n/a**	-17	-17	-18	-19	-22
Trafalgar	n/a**	n/a**	-15	-26	-27	-32
Upper Mt. Thom	-28	-23	-21	-24	-23	-27
Marshy Hope	-26	-25	-24	-24	-29	-30
Springhill	-39	-35	-25	-30	-31	-29
Yarmouth	-20	-18	-14	-15	-13	-15
Granite Village	n/a**	n/a**	n/a**	-20	-16	-22
Trunk 12	-25	-25	-20	-23	-23	-27
Kingston	-24	-24	-20	-20	-23	-22
Mt. Uniacke	-27	-25	-20	-22	-24	-26
Blackville, NB	n/a**	n/a**	n/a**	-31	-31	-34

* *Winter = mid-December, previous year, to mid-March.*
** *n/a indicates that data was not available from this tower because it was a newly established tower.*
*** *The readings for Winter 2009 are up to and including 1 March 2009.*

Speaking of cold temperatures, Keith is out getting his furnace repaired so that leaves me to add a title to this chilly winter. I've heard it called a real old-fashioned winter: lots of snow and cold temperatures. But how will this affect forest insects, especially the balsam woolly adelgid? To wax a bit poetic, as the tides around Nova Scotia ebb and flow so do the insect populations: just not as predictably! Wouldn't it be great if we could say, "there will be an insect population here and the level will be this." But enough poetic licence . . .

Insects native to Nova Scotia are quite adept at surviving cold winters. In most cases, a wet spring or a late frost, may do more to decrease insect populations than a cold winter. However, with a wet spring, mosquitoes, black flies, and fungal diseases thrive: it's good to know there will always be work to do.

The balsam woolly adelgid is an introduced pest of balsam fir. It is affected by a cold winter. Keith has been keeping track of temperatures recorded by the NSDTIR weather stations for the past six years. These temperatures give a snapshot of the conditions across the province. Although -25°C, will decrease the BWA population, it is important to realize that snow cover, elevation, and coastal influence will temper the amount of cold that reaches the overwintering BWA.

It's best to assess your Christmas tree lot to have an idea of what you will be facing later in the year. Chrissy has provided a few more details on the BWA in her article on page 3 and a link to the assessment method developed by Mike LeBlanc and Keith Moore in her article.

Hopefully we've seen the last of the -30°C weather until next winter!

Project Updates (contd.)

Gypsy Moth Multipher (permanent) Trap Survey

Jacqui Gordon

Back to page 1

In 2008, gypsy moth permanent traps were placed by Pest Detection Officers across the province. Traps were deployed in the Canadian Food Inspection Agency (CFIA) regulated and non regulated zones to provide a yearly snapshot of the gypsy moth population. Trap captures reflected an increase in Hants County, Lunenburg County, and in western Halifax County. As yet, the multipher trap in Caribou Provincial Park does not reflect the increases seen in the New Glasgow and Pictou (town) delta traps. (The delta trap data and map were presented in the September/October 2008 issue of the newsletter.)

The CFIA does not plan to expand the regulated zone in 2009.

Figure 14 depicts the results from the multipher (permanent) traps for the 2008 season.

Thanks as always to the Pest Detection Officers. Without your contribution, this survey would not be possible.

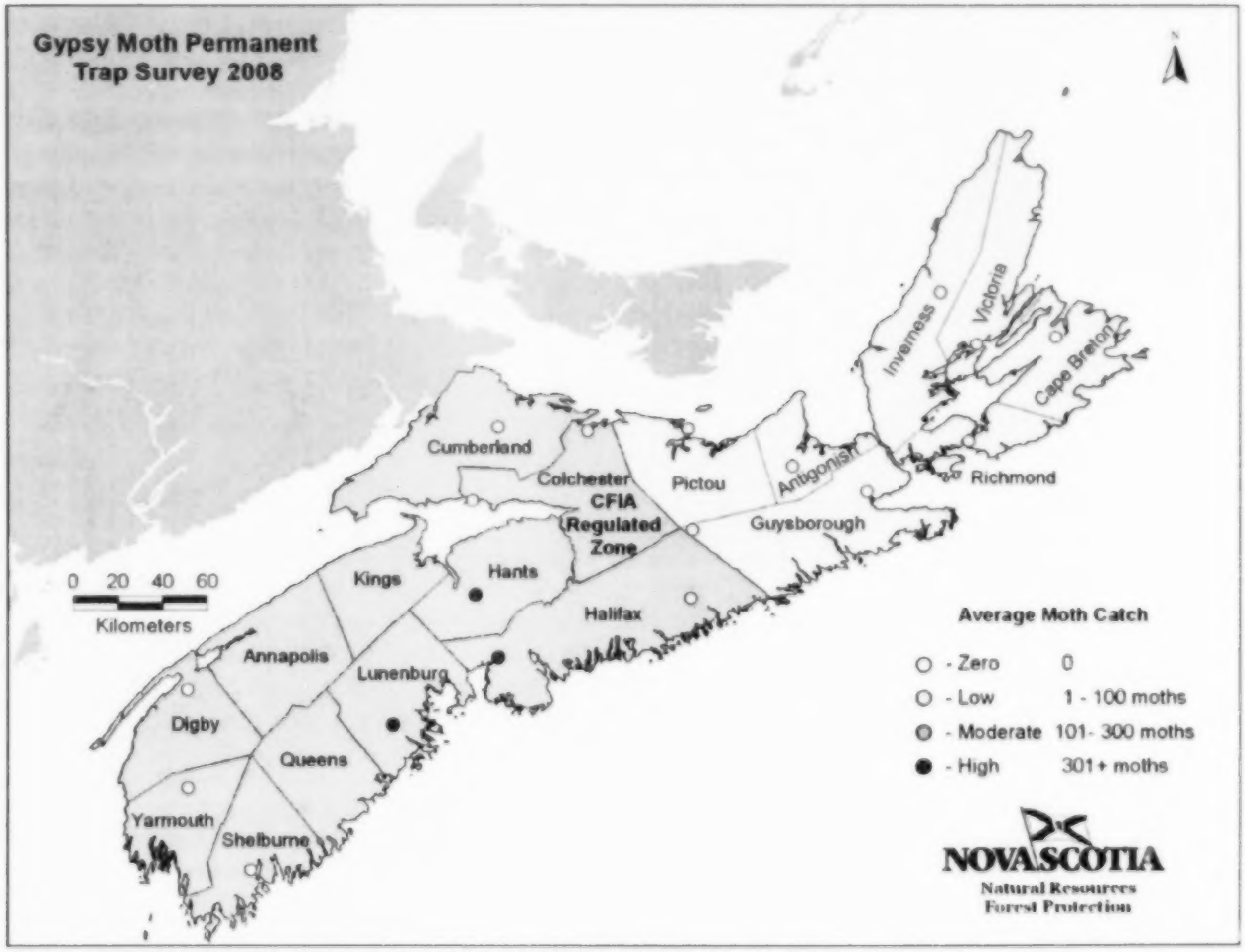
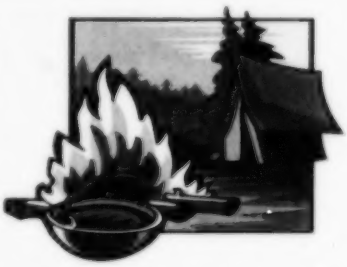


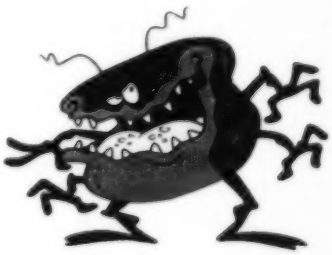
Figure 14. Results from the gypsy moth multipher (permanent) trap survey, 2008.

THE LAST LAUGH ...

A woman walked into the kitchen to find her husband stalking around with a fly swatter.
"What are you doing?", she asked.
"Hunting Flies," he responded.
"Oh! Killing any?", she asked.
"Yep, 3 males, 2 females," he replied.
Intrigued, she asked, "How can you tell them apart?"
He responded, "3 were on a beer can, 2 were on the phone."
(Humour courtesy of Peter Neily, DNR Truro)



Sherlock Holmes and Dr Watson went on a camping trip. After a good meal and a bottle of wine they lay down for the night, and went to sleep. Some hours later, Holmes awoke and nudged his faithful friend awake. "Watson, look up at the sky and tell me what you see." Watson replied, "I see millions and millions of stars." "What does that tell you?" Holmes questioned. Watson pondered for a minute. "Astronomically, it tells me that there are millions of galaxies and potentially billions of planets. Astrologically, I observe that Saturn is in Leo. Horologically, I deduce that the time is approximately a quarter past three. Theologically, I can see that God is all powerful and that we are small and insignificant. Meteorologically, I suspect that we will have a beautiful day tomorrow. What does it tell you?" Holmes was silent for a minute, then spoke. "Watson, you idiot. Someone has stolen our tent."



Every night, Arnold would go down to the liquor store, get a six-pack, bring it home, and drink it while he watched TV. One night, as he finished his last beer, the doorbell rang. He stumbled to the door and found a six-foot cockroach standing there. The bug grabbed him by the collar and threw him across the room, and left.

The next night, after he finished his 3rd beer, the doorbell rang.

He walked slowly to the door and found the same six-foot cockroach standing there. The big bug punched him in the stomach, then left.

The next night, after he finished his 1st beer, the doorbell rang again. The same six-foot cockroach was standing there. This time he was kneed in the groin and hit behind the ear as he doubled over in pain. Then the big bug left.

The fourth night Arnold didn't drink at all. The doorbell rang. The cockroach was standing there. The bug beat him up and left him in a heap on the living room floor.

The following day, Arnold went to see his doctor. He explained events of the preceding four nights.

"What can I do?" he pleaded.

"Not much," he doctor replied. "There's just a nasty bug going around."